

On the morning of the 22d similar warnings were issued to forestry interests in the States of Washington and Oregon. These forecasts were minutely verified by the subsequently recorded temperature, humidity, and winds. After the 25th and until the end of the month the weather remained unsettled and showery in the northern half and fair in the southern half of the district, and at its close the temperature was low with frosts in the Plateau States.

Special weather forecasts for the information of driers of fruit were issued daily during the month and broadcast by radiophone. A specimen of this type of forecast, i. e., the one issued on the 30th, follows:

In the Santa Rosa, Napa, Sonoma, Santa Clara, Sacramento and San Joaquin Valleys the weather will remain fair during the next several days with moderate temperature and gentle changeable winds. Good drying weather is indicated.

—E. H. Bowie.

RIVERS AND FLOODS

By H. C. FRANKENFIELD

The rise in the lower Rio Grande in early August, on which report was deferred until this issue of the REVIEW, passed flood stage at only one Weather Bureau gaging station—San Benito, Tex. No reports of damage have been received.

Virtually coincident with the above, however, another rise of more importance was in progress in the vicinity of and below El Paso, Tex. Definite reports are similarly lacking for this flood, though revised estimates by newspapers place losses resulting from it at \$275,000—chiefly in crops and levee damage. The progress of the crest, which gradually diminished, was evident in moderate rises downstream later in August, but flood stage was not reached at any Weather Bureau station.

A third and much more serious rise occurred in the vicinity of El Paso early in September. Of this flood Mr. Robert M. Shaver, official in charge of the Weather Bureau office at El Paso, reports as follows:

The occurrence of heavy rains over the upper portion of the Rio Grande watershed between El Paso and the Elephant Butte Dam, which is 122 miles northwest of El Paso, on August 31 and September 1, 1925, caused a rapid rise in the river.

Limited overflows occurred at a few points in the valley northwest of El Paso on September 1 and 2; and serious overflows at several places from 6 miles northwest to 40 miles southeast of El Paso during September 2, 3, 4, and 5.

Engineers estimated that 11,500 acres of land were flooded on the American side of the river, and 5,000 acres on the Mexican side; and that 75 per cent of this land was under cultivation. Between 300 and 400 houses, built of adobe, a majority of which were in El Paso and its immediate vicinity, were ruined or seriously damaged when their walls were crumbled by coming in contact with the water. A greater number of houses suffered lesser injuries. The most conservative estimates placed the total loss occasioned by the flood at \$1,000,000.

The United States Reclamation Service, with project headquarters at El Paso and substations and river gages at certain points along the river, was able to follow the stages of the rise and issue adequate warnings.

There would have been far greater destruction had not dikes been prepared hastily at the weaker points along the river bank. This work was directed largely by the local officials of the United States Reclamation Service and the city engineer. The farmers and their helpers were assisted greatly in the construction of the dikes by soldiers and materials from Fort Bliss.

Since the completion of the Elephant Butte Dam in 1916, there has been a gradual rise in the bed of the river, due to the decrease in the rate of movement of the river. There is also a large horse-shoe bend in the river just below El Paso which also retards the movement. The increase in elevation of the river bed at the Santa Fe Street Bridge at El Paso is now 9 feet. This induces a dangerous condition, as comparatively small rises in the river will produce overflows.

Heavy rains in the lower portion of the watershed again raised the river to above flood stage at Rio Grande

City and San Benito on the 8th and 9th. Of the results of this rise, Mr. J. H. Jarboe, official in charge of the Weather Bureau office at San Antonio, Tex., reports in part as follows:

Levees, weakened by continuous rains during the month, gave way in several places and large sections of farm lands were flooded. Most crops had been harvested and the losses were mostly in delayed farm work, delayed business and transportation, and about \$40,000 spent in holding and repairing levees, mostly in Cameron County.

A destructive local flood, caused by heavy rainfall over the precipitous and narrow Squillchuck Canyon and resulting in the loss of 14 lives and property damage estimated at \$130,500, occurred near Wenatchee, Wash., during the afternoon of September 5. Since no rain gages are maintained in the area over which the heaviest rain fell, no data are available as to its amount; but the topography of the canyon is such that even a moderately heavy fall, if sudden enough, could readily have caused a flood of this extremely destructive type. The losses were apportioned as follows:

Railroad property.....	\$75,000
Highways.....	3,500
Irrigation canals and ditches.....	4,000
Fruit trees washed out.....	3,000
Buildings, automobiles, and other property.....	45,000
Total.....	130,500

The high stages occurring in the Gila and Hassayampa Rivers of Arizona were without consequence; and no report of damage has been received of the moderate flood in the Grand River of Missouri on the 13th and 14th.

Low water.—Moderate rainfall during the last decade of September in the Southern States brought to an end the drought which had continued in that section since June. In addition to the widespread unfavorable effect of this drought on crops, farmlands, forests, etc., rivers fell to extremely low stages, with the result that water power failed in many sections, street-car schedules were curtailed, mill operations reduced, navigation seriously impeded, and the consumption of electricity generally curtailed. Many communities, confronted with an acute shortage of water for direct use, were compelled to ration their supplies.

The river stages were the lowest of record in many sections, and a statistical summary relative thereto appears in the following table:

Principal rivers in which low-water records were established during August-September, 1925

River and station	Low-water stage (feet)	Date (1925)	Previous low-water record (feet)	Date
Peedee: Cheraw, S. C.....	-2.0	Sept. 13	0.0	Aug. 2, 1886
Santee: Rimini, S. C.....	0.2	Sept. 9	1.0	Nov. —, 1904
Oconee: Dublin, Ga.....	-2.4	Sept. 7	-1.8	Sept. 14, 1914
Ocmulgee:				
Hawkinsville, Ga.....	0.8	Sept. 11	1.3	Sept. 15, 1911
Abbeville, Ga.....	-1.7	Sept. 5	-1.0	June 17, 1898
Chattahoochee: Norcross, Ga.....	0.6	Aug. 25	1.0	Sept. 30, 1911
Flint:				
Woodbury, Ga.....	-0.9	Sept. 24	-0.5	Oct. 24, 1904
Albany, Ga.....	-3.2	Sept. 27	-1.4	July 31, 1921
Apalachicola:				
River Junction, Fla.....	-2.1	Sept. 24	-0.2	Nov. 30, 1922
Blountstown, Fla.....	1.6	Sept. 23	3.0	(¹)
Coosa:				
Mayos Bar, Ga.....	-2.8	Sept. 5	-0.6	Sept. 17, 1914
Wetumpka, Ala.....	-2.5	Aug. 24	-2.0	Aug. 25, 1924
Alabama: Montgomery, Ala.....	-4.0	Sept. 22	-3.4	Nov. 25, 1924
Pearl: Monticello, Miss.....	-0.5	Sept. 11	-0.3	Oct. 20, 1924
Miami:				
Dayton, Ohio.....	-0.1	Sept. 5	0.6	July 27, 1923
Hamilton, Ohio.....	-1.4	Sept. 10	-1.3	Oct. 26, 1924
Tennessee:				
Knoxville, Tenn.....	-1.9	Sept. 10	-1.5	Dec. 1, 1895
Guntersville, Ala.....	-0.5	Sept. 29	-0.4	Nov. 18, 1924
Florence, Ala.....	-2.9	Sept. 25	-1.0	Nov. 27, 1924
Riverton, Ala.....	4.7	Sept. 28	5.0	Oct. 24, 1904
Savannah, Tenn.....	-2.6	Sept. 8	0.0	(¹)
Johnsonville, Tenn.....	-1.9	Sept. 11	-0.9	Oct. 26, 1904
Arkansas:				
Tulsa, Okla.....	0.4	Sept. 5	1.0	July 16, 1910
Little Rock, Ark.....	-2.8	Sept. 10	-2.4	Aug. 18, 1918

¹ And subsequent dates.

² Estimated.

³ About.

⁴ Data unknown.

Principal rivers in which low-water records were established during August-September, 1925—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
<i>Mississippi drainage</i>					
Grand:	<i>Feet</i>			<i>Feet</i>	
Gallatin, Mo.-----	20	13	13	21.5	13
Chillicothe, Mo.-----	18	13	14	21.3	14
<i>West gulf drainage</i>					
Rio Grande:					
Rio Grande City, Tex.-----	15	8	10	21.8	9
San Benito, Tex.-----	21	9	19	24.4	11-12
<i>Pacific drainage</i>					
Gila: Kelvin, Ariz.-----	5	2	5	7.0	4
Hassayampa: Wickenburg, Ariz.-----	6	19	19	5.0	19
		19	19	6.0	19

MEAN LAKE LEVELS DURING SEPTEMBER, 1925

BY UNITED STATES LAKE SURVEY

[Detroit, Mich., Oct. 8, 1925]

The following data are reported in the "Notice to Mariners" of the above date:

Data	Lakes ¹			
	Superior	Michigan and Huron	Erie	Ontario
Mean level during September, 1925:	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>	<i>Feet</i>
Above mean sea level at New York-----	601.40	578.22	570.90	244.56
Above or below—				
Mean stage of August, 1925-----	-0.09	-0.20	-0.18	-0.34
Mean stage of September, 1924-----	-0.40	-1.31	-1.05	-1.09
Average stage for September last 10 years-----	-1.18	-2.29	-1.43	-1.41
Highest recorded September stage-----	-2.68	-5.21	-3.04	-3.06
Lowest recorded September stage-----	-0.09	-1.31	-0.38	+0.56
Average departure (since 1860) of September level from August level-----	+0.05	-0.20	-0.26	-0.40

¹ Lake St. Clair's level: In September, 1925, 573.59 feet.

THE EFFECT OF WEATHER ON CROPS AND FARM OPERATIONS, SEPTEMBER, 1925

By J. B. KINCER

General summary.—During the first week in September droughty conditions prevailed over nearly all sections of the country east of the Rocky Mountains, and the continued dry weather, excessive sunshine, and, in some places, unprecedented September heat, ripened outstanding crops rapidly and prematurely in many cases. Plowing was practically suspended in most interior States and the seeding of fall grains was impossible in many sections.

During the second week of the month, however, the drought was largely broken by generous rainfall, which was especially effective in practically all the central valley States, and the soil was put in good condition. Late truck, garden crops, and pastures were much revived. In the Southeast the rainfall was insufficient to be substantially beneficial and late crops continued to deteriorate. This was especially true in the States comprising the area from Virginia southward. Damage from the frost that occurred in some central-northern districts about the middle of the month was not material, as most crops had matured.

During the last half of the month conditions remained favorable for agricultural interests in most sections, except that moisture continued largely insufficient in the Southeastern States. In some interior States field work was somewhat interrupted by too much rain near the close of the month, and the soil had become too dry in parts of the Pacific Northwest.

Small grains.—Harvesting of wheat was practically completed early in the month, and threshing was well along in the northern border States. Until about the 10th it was much too dry for plowing and the preparation of seed beds for the new wheat crop, but thereafter there was sufficient moisture for this work and good progress was reported. By the 15th plowing had been resumed generally, with seeding begun in the upper Ohio Valley and in the Plains States, and by the close of the month sowing was in full progress in much of the Wheat Belt. There was some interruption by rainfall to seeding in the lower Great Plains, the lower Missouri Valley, and some upper Mississippi Valley districts. Early-seeded wheat was coming up to a good stand in many localities. Grain sorghums in the lower Great Plains showed improvement after the rains.

Corn.—This crop ripened too rapidly during the first part of the month, because of the prevailing warm, dry weather, and by the 10th about half of the crop was safe from frost in Iowa and Indiana, and the bulk of it was safe in Missouri. Late corn was benefited by rain, especially in the Southern States, but the hot, dry weather early in the month caused some deterioration in the main Corn Belt. At the close of the month the crop was nearly all safe and harvest was well advanced, though late corn was somewhat damaged by frost during the last week in some northeastern districts. On the whole, frost damage this year was negligible.

Cotton.—The first part of the month continued warm and dry and unfavorable for late cotton in nearly all portions of the South. Bolls opened very rapidly and picking and ginning made splendid progress. After the first week, showers and more moderate temperatures over the western half of the belt made much better conditions for the crop, and the late plants made fair to very good advance; there was some damage by wetness to open and unpicked cotton, but this was not extensive. In the eastern portion of the belt it continued warm, dry, and unfavorable for the development of the late crop. The third week had generally fair weather in practically all sections, which was favorable for picking and ginning, but rather widespread rains the latter part of the month caused considerable retardation in this work in the western cotton States. Harvest was well advanced for the season at the close of the month.

Miscellaneous crops.—Pastures showed general improvement east of the Rocky Mountains, except in some southeastern districts where it continued too dry. Range conditions continued favorable in the Northwest, and grazing was mostly good in the Southwest. Some livestock were moved to winter ranges in the Rocky Mountain section. Late truck and garden crops improved in the Southern States, particularly in central and west Gulf districts, and unmaturing minor crops made good advance quite generally in the interior of the country. Potato harvest was in progress in the northern and Northeastern States, with generally good returns reported from Pennsylvania and Ohio.